Test Report No.:
REDSZ2025-0001

RF Test Report

NAME OF SAMPLE	:	**Doorbell Camera Hub G410**
APPLICANT	:	**Lumi United Technology Co., Ltd.**
CLASSIFICATION OF TEST	:	**N/A**

CVC Testing Technology (Shenzhen) Co., Ltd.

Applicant	**Name: Lumi United Technology Co., Ltd** **Address: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue,Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China**
Manufacturer	**Name: Lumi United Technology Co., Ltd** **Address: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue,Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China**
Equipment Under Test	**Name: Doorbell Camera Hub G410** **Model/Type: CH-C09E** **Additional Model: CH-C09D** **Serial NO.: N/A** **Sample NO.: 1-1**

Date of Receipt.	**2024-12-19**	Date of Testing	**2024.12-19 ~ 2025-03-12**

Test Specification	**Test Result**
ETSI EN 305 550-1 V1.2.1 (2014-10) **ETSI EN 305 550-2 V1.2.1 (2014-10)**	PASS
Evaluation of Test Result	The equipment under test was found to comply with the requirements of the standards applied. Seal of CVC **Date of issue:2025-03-12,Correction 1: 2025-04-21**

Compiled by:	Reviewed by:	Approved by:
Liang Jiatong	Mo Xianbiao	Dong Sanbi
Name Signature	Name Signature	Name Signature

Other Aspects: NONE.

Abbreviations:OK, Pass= passed Fail = failed N/A= not applicable EUT= equipment, sample(s) under tested

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
REDSZ2025-0001	Original release	2025-03-12
REDSZ2025-0001	Correct the power supply information	2025-04-21

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

ETSI EN 305 550-1 V1.2.1 (2014-10) ETSI EN 305 550-2 V1.2.1 (2014-10)			
CLAUSE	**TEST PARAMETER**	**RESULT**	**REPORT SECTION**
Transmitter Parameters			
4.2.1.1	Spectral power density	Pass	See section 3.1
4.2.1.2	Rf output power	Pass	See section 3.2
4.2.1.3	Permitted range of operating frequencies	Pass	See section 3.3
4.2.1.4	Unwanted emissions in the out-of-band domain	Pass	See section 3.4
4.2.1.5	Transmitter unwanted emissions in the spurious domain	Pass	See section 3.5
Receiver Parameters			
4.2.2	Receiver spurious components	N/A(Note1)	See section 3.6
Note1: The EUT can’ t not operate in receive only mode.			

1.1 LIST OF TEST AND MEASUREMENT INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial Number	Cal. interval	Cal. Due
Radiation Spurious(30MHz-40GHz)					/
Signal&Spectrum Analyzer	Rohde&Schwarz	FSV 40	101898	1 year	2025.4.27
EMI Test Receiver	Rohde&Schwarz	ESR3	102693	1 year	2025.5.24
Antenna(30MHz~1001MHz)	SCHWARZBECK	VULB 9168	1133	1 year	2026.1.22
Horn antenna(1GHz-18GHz)	ETS	3117	227611	1 year	2025.4.02
Horn antenna(18GHz-40GHz)	QMS	QMS-00880	22051	1 year	2025.3.24
3m anechoic chamber	MORI	966	CS0300011	3 year	2026.5.18
Filter group(RSE-BT/WiFi)	Rohde&Schwarz	WiFi /BT Variant 1	100820	1 year	2025.4.28
Filter group(RSE-Cellular)	Rohde&Schwarz	Cellular Variant 1	100768	1 year	2025.4.28
Preamplifier(1GHz-18GHz)	Rohde&Schwarz	SCU-18F	100801	1 year	2025.4.28
Preamplifier(18GHz-40GHz)	Rohde&Schwarz	SCU40A	101209	1 year	2025.4.28
#2 control room	MORI	433	CS0300028	3 year	2026.5.16
Temperature and humidity meter	/	C193561517	C193561517	1 year	2025.4.28
Radiation Spurious(Above 40GHz)					/
Equipment	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. interval**	**Cal. Due**
3m anechoic chamber	MORI	966	CS0300011	3 year	2026.5.18
#2 control room	MORI	433	CS0300028	3 year	2026.5.16
Temperature and humidity meter	/	C193561517	C193561517	1 year	2025.4.28
Signal&Spectrum Analyzer	keysight	N9040B	CS0300074	1 year	2025.9.24
SA Expansion Module(40-60GHz)	VDI	N9029AV19	CS0300075	3 year	2025.9.14
SA Expansion Module(60-90GHz)	VDI	N9029AV12	CS0300076	3 year	2025.9.14
SA Expansion Module(90-140GHz)	VDI	N9029AV08	CS0300077	3 year	2025.9.14
SA Expansion Module(140-220GHz)	VDI	N9029AV05	CS0300078	3 year	2025.9.14
SA Expansion Module(220-330GHz)	VDI	N9029AV03	CS0300079	3 year	2025.9.14
Horn antenna(40-60GHz)	CMI	HO19R	CS0300086	3 year	2025.9.14
Horn antenna(60-90GHz)	CMI	HO12R	CS0300088	3 year	2025.9.14
Horn antenna(90-140GHz)	CMI	HO08R	CS0300090	3 year	2025.9.14
Horn antenna(140-220GHz)	CMI	HO05R	CS0300092	3 year	2025.9.14
Horn antenna(220-330GHz)	CMI	HO03R	CS0300094	3 year	2025.9.14

1.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

No.	Item	Measurement Uncertainty
1	Occupied Channel Bandwidth	±1.86%
2	RF output power, conducted	±0.9dB
3	Power Spectral Density, conducted	±0.8dB
4	Unwanted Emissions, conducted	±2.7dB
5	Radiated Emissions(30MHz-1GHz)	±5.0dB
6	Radiated Emissions(1GHz-18GHz)	±4.8dB
7	Radiated Emissions(18GHz-40GHz)	±5.1dB
8	Radiated Emissions(40GHz-60GHz)	±4.8dB
9	Radiated Emissions(60GHz-90GHz)	±4.8dB
10	Radiated Emissions(90GHz-140GHz)	±5.0dB
11	Radiated Emissions(140GHz-220GHz)	±5.1dB
12	Radiated Emissions(220GHz-300GHz)	±4.8dB
6	Temperature	±0.73°C
	Supply voltages	±0.37 %
7	Humidity	±3.9 %
8	Time	±0.27 %
Remark: 95% Confidence Levels, k=2.		

1.3 TEST LOCATION

The tests and measurements refer to this report were performed by EMC testing Lab. of CVC Testing Technology (Shenzhen) Co., Ltd.

Lab Address: No. 1301-14&16, Guanguang Road, Xinlan Community, Guanlan Subdistrict, Longhua District, Shenzhen, Guangdong, China
Post Code：518110 Tel：0755-23763060-8805
Fax：0755-23763060 E-mail：sz-kf@cvc.org.cn
FCC(Test firm designation number：CN1363)
IC(Test firm CAB identifier number：CN0137)
CNAS(Test firm designation number：L16091)

2 GENERAL INFORMATION

2.1 GENERAL PRODUCT INFORMATION

PRODUCT	Doorbell Camera Hub G410
BRAND	N/A
TEST MODEL	CH-C09E
ADDITIONAL MODEL	CH-C09D
POWER SUPPLY	Battery input : 4.5V⎓0.5A Wired input : DC 12-24V 0.5A AC 12-24V 0.2A 50/60Hz
OPERATING FREQUENCY	59 ~ 61.5GHz
CHANNEL NUMBER	1
OPERATING TEMPERATURE RNAGE	-18°C~50°C
EIRP (Max.)	15.46dBm
MODULATION TYPE	FMCW
ANTENNA TYPE (NOTE 3)	Internal Antenna@5.53dBi
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	N/A

NOTE:

1. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. Since the above data and/or information is provided by the client, CVC is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.

2.2 OTHER INFORMATION

The EUT only have one channel.

CHANNEL	FREQUENCY (MHz)
1	60250

2.3 TEST MODE

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ axis (if EUT with antenna diversity architecture) and packet type.

The worst case was found when positioned on x axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

MODE	ANTENNA	TEST ITEM
Mode 1	Antenna Array(1TX/3RX)	ALL

2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

ETSI EN 305 550-1 V1.2.1 (2014-10)

ETSI EN 305 550-2 V1.2.1 (2014-10)

ERC Recommendation 74-01

All test items have been performed and recorded as per the above standards

2.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Support Equipment							
NO	**Description**	**Brand**	**Model No.**	**Serial Number**			**Supplied by**
1	Laptop	Lenovo	V14	PFNXB1628023			Lab
Support Cable							
NO	**Description**	**Quantity (Number)**	**Length (m)**	**Detachable (Yes/ No)**	**Shielded (Yes/ No)**	**Cores (Number)**	**Supplied by**
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A

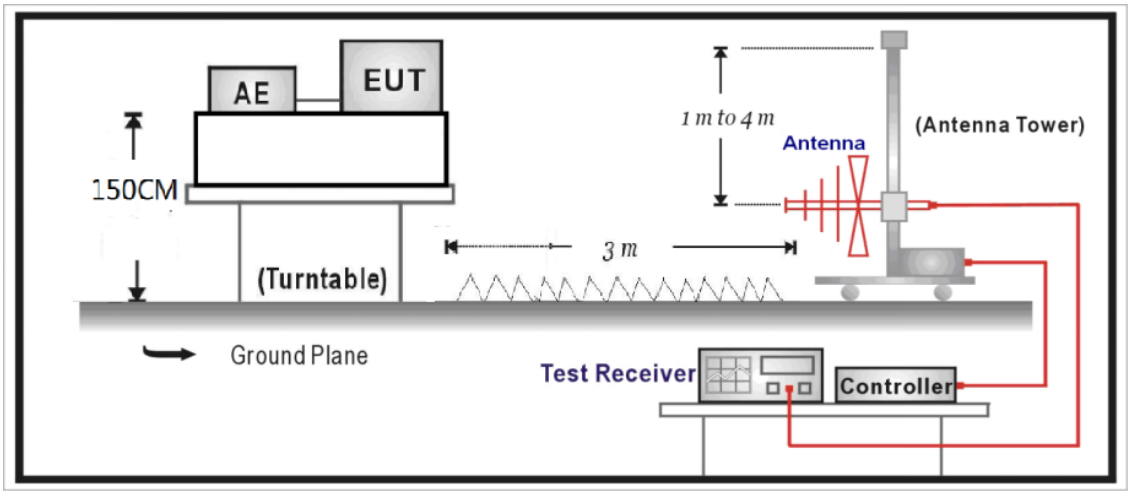
2.6 FAR FIELD CONDITION FOR FREQUENCY ABOVE 18GHZ

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntableThe measurement antenna is in the far field of the EUT per formula $2D^2/\lambda$ where D is the larger between thedimension of the measurement antenna and the transmitting antenna of the EUT. In this case, "D" is the largest dimension of the measurement antenna. The EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer.

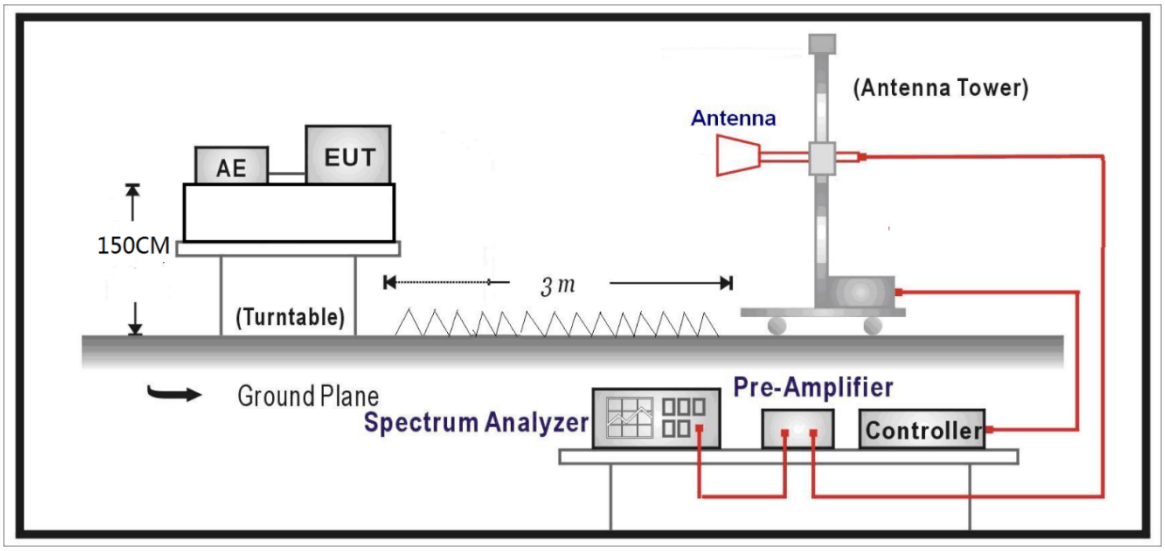
HornAntenna	Frequency (GHz)	Antenna Dimension A(m)	Wavelength (λ)(m)	Farfield R(m)>=$2D^2/\lambda$	Measurement Distance(D)(m)
QMS-00880	18	0.08	0.0167	0.77	3
	40	0.08	0.0075	1.71	
HO19R	40	0.046	0.0075	0.56	1
	60	0.046	0.005	0.85	
HO12R	60	0.03	0.005	0.36	1
	90	0.03	0.0033	0.55	
HO8R	90	0.019	0.0033	0.22	1
	140	0.019	0.0021	0.34	
HO5R	140	0.012	0.0021	0.14	1
	220	0.012	0.0014	0.21	
HO3R	220	0.008	0.0014	0.09	1
	330	0.008	0.0009	0.14	

2.7 RADIATED TEST SETUP

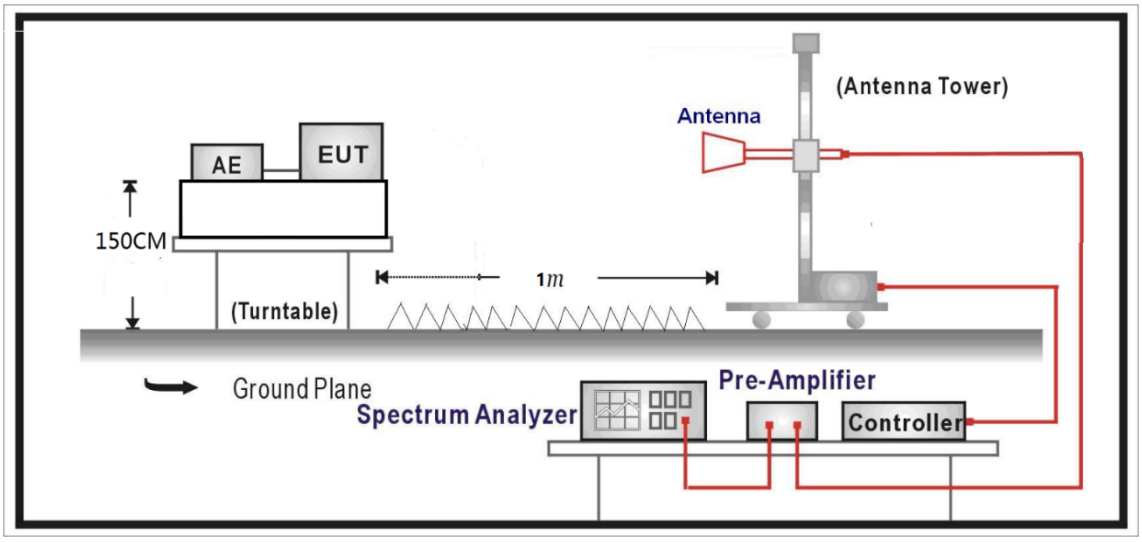
30MHz-1GHz Test Setup:



1GHz -40GHz Test Setup:



Above 40GHz Test Setup:



3 TEST TYPES AND RESULTS

3.1 SPECTRAL POWER DENSITY

3.1.1 Limit

Condition	Maximum Power Spectral Density
57 GHz to 64 GHz	13 dBm/MHz e.i.r.p.

3.1.2 Test procedure

The description in ETSI EN 305 550-1, clause 7.1.3 applies.

METHOD OF MEASUREMENT	
☐ Conducted measurements	☒ Radiated measurements

3.1.3 Test setup

See section 2.6 of this report.

3.1.4 Test result

Center Frequency [GHz]	Peak Frequency [GHz]	Spectral Power Density [dBm/MHz]	Limit [dBm/MHz]	Verdict
60.25	59.025	-10.28	13	PASS

The Spectral Power Density was evaluated on vertical and horizontal polarization, the worst case is Vertical polarization.

3.2 RF OUTPUT POWER

3.2.1 Limits

Frequency Bands	Limit
57 GHz to 64 GHz	20dBm(E.I.R.P)/10dBm(Output Power)

3.2.2 Measurement procedure

The description in ETSI EN 305 550-1, clause 7.2.3 applies.

METHOD OF MEASUREMENT	
☐ Conducted measurements	☒ Radiated measurements

3.2.3 Test setup

See section 2.6 of this report.

3.2.4 Test result

Test Frequency (GHz)	EIRP (dBm)	EIRP Limit (dBm)	Output Power (dBm)	Output Power Limit(dBm)	Verdict
60.25	15.46	20	9.93	10	PASS

The EIRP was evaluated on vertical and horizontal polarization, the worst case is Vertical polarization.

3.3 PERMITTED RANGE OF OPERATING FREQUENCIES

3.3.1 Limits

The occupied bandwidth, the bandwidth in which 99 % of the wanted emission is contained, and the necessary bandwidth of the transmitter shall fall within the assigned frequency band.

Item	Permitted Range of Operating Frequencies
Frequency Bands	57 GHz to 64 GHz

3.3.2 Measurement procedure

The description in ETSI EN 305 550-1, clause 7.3.3 applies.

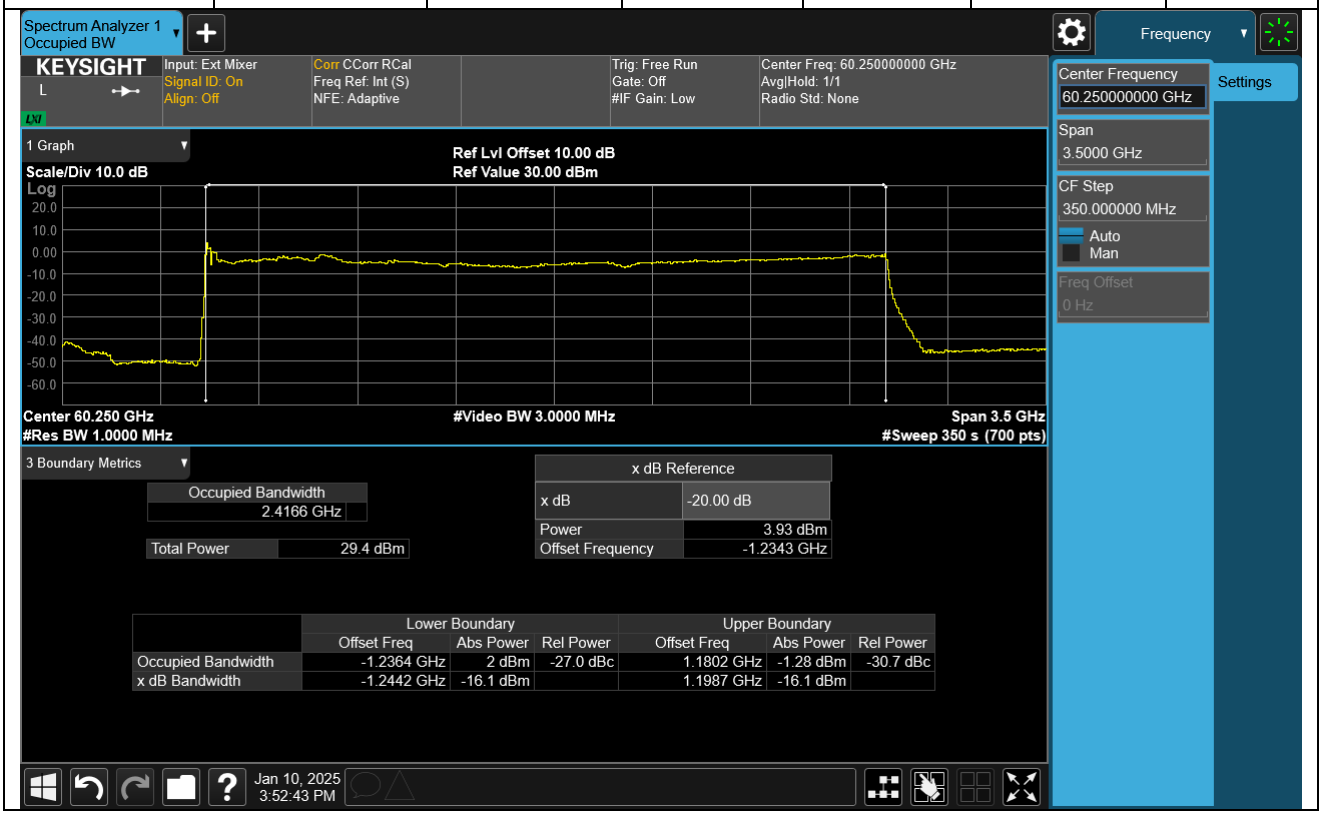
METHOD OF MEASUREMENT	
☐ Conducted measurements	☒ Radiated measurements

3.3.3 Test setup

See section 2.6 of this report.

3.3.4 Test result

99% Occupied Bandwidth						
Center Frequency [GHz]	Occupied bandwidth[GHz]	FL [GHz]	FH [GHz]	FL Limit(GHz)	FH Limit(GHz)	Verdict
60.25	2.4166	59.0136	61.4302	57	64	PASS

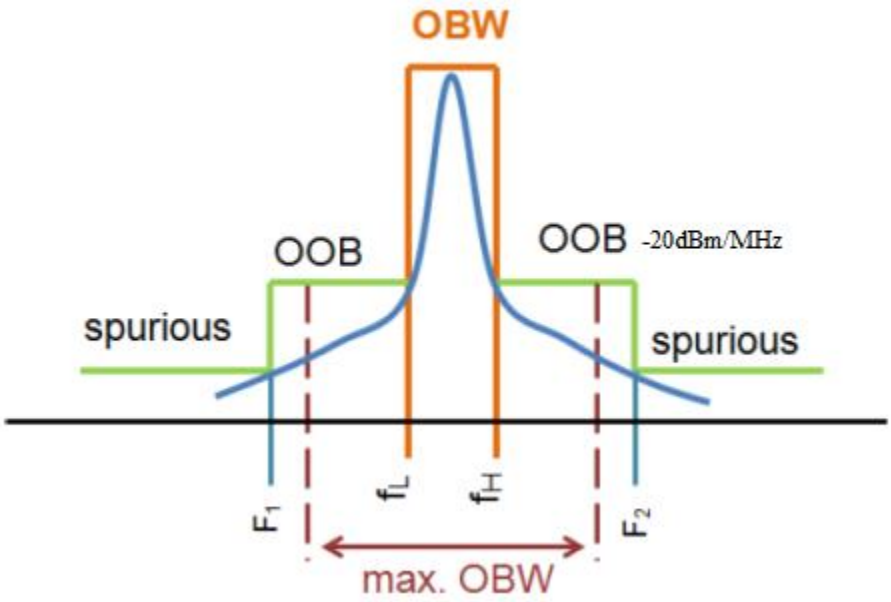


During the test, the preliminary test was performed in Transmitter output power with five conditions (NTNV, HTHV, HTLV, LTHV and LTLV), and the worst-case condition was recorded in this report.

3.4 UNWANTED EMISSIONS IN THE OUT-OF-BAND DOMAIN

3.4.1 Limits

The RMS mean power spectral density radiated in the calculated out-of-band domain (between F1 to f_L and f_H to F2 band) shall not be greater than -20dBm/MHz



The values fL and fH are the results of the operating frequency range conformance test
The lowest operating frequency can be defined as f_L,
The highest operating frequency can be defined as f_H.

$$F1 = fC - (2{,}5 \times (f_H - f_L)),\ F2 = fC + (2{,}5 \times (f_H - f_L))$$

F1 and F2 test ranges select the maximum value, which can fully meet the limit requirements at this frequency up to the range of test results, the maximum value of F1 F2 is shown in the following table.

Table 11b: Limits for the max. F1 and F2 frequency, based on the max. theoretical OBW of the EUT

Frequency Bands	Centre frequency	Max OBW	F_1	F_2
57 GHz to 64 GHz	60,5 GHz	7 GHz	43 GHz	78 GHz
61,0 GHz to 61,5 GHz	61,25 GHz	500 MHz	60 GHz	62,5 GHz
122 GHz to 123 GHz	122,5 GHz	1 GHz	120 GHz	125 GHz
244 GHz to 246 GHz	245 GHz	2 GHz	240 GHz	250 GHz

3.4.2 Test procedure

The description in ETSI EN 305 550-1, clause 7.4.3 applies.

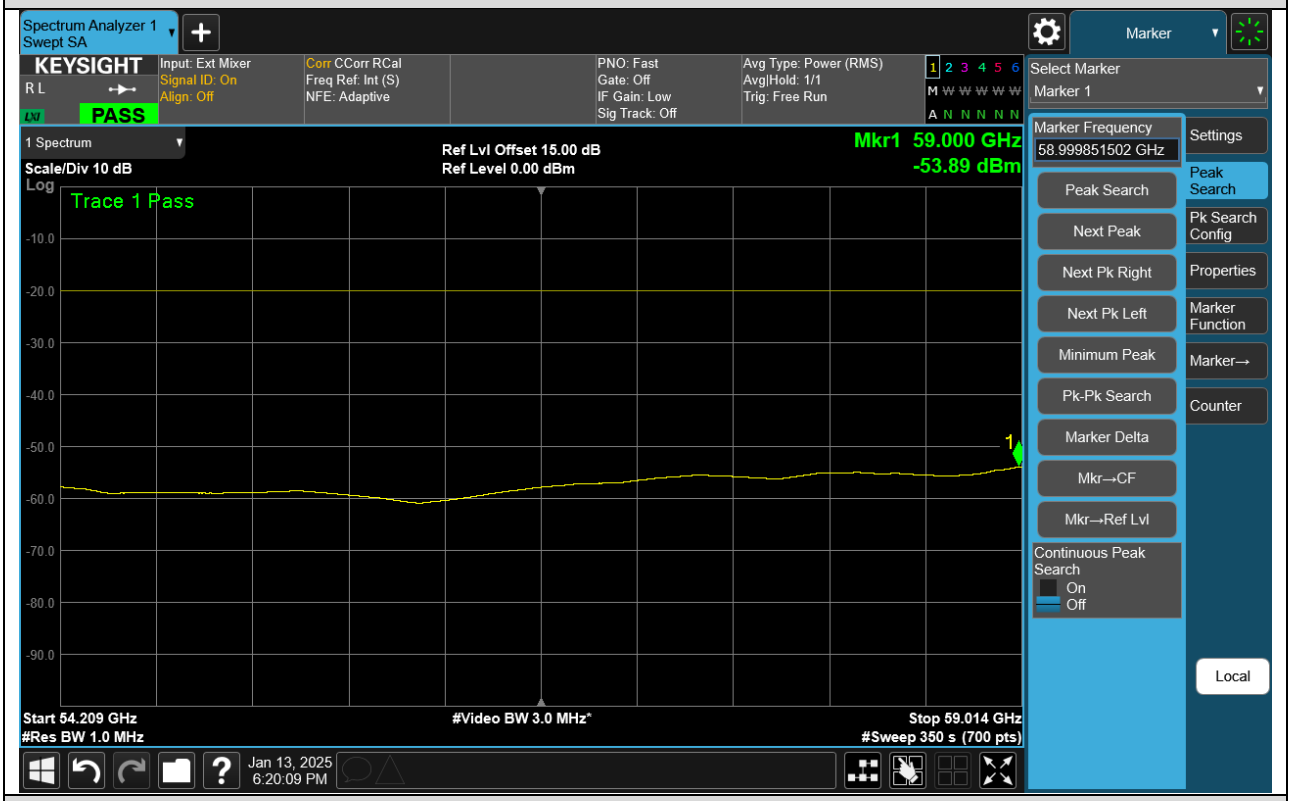
METHOD OF MEASUREMENT	
☐ Conducted measurements	☒ Radiated measurements

3.4.3 Test setup

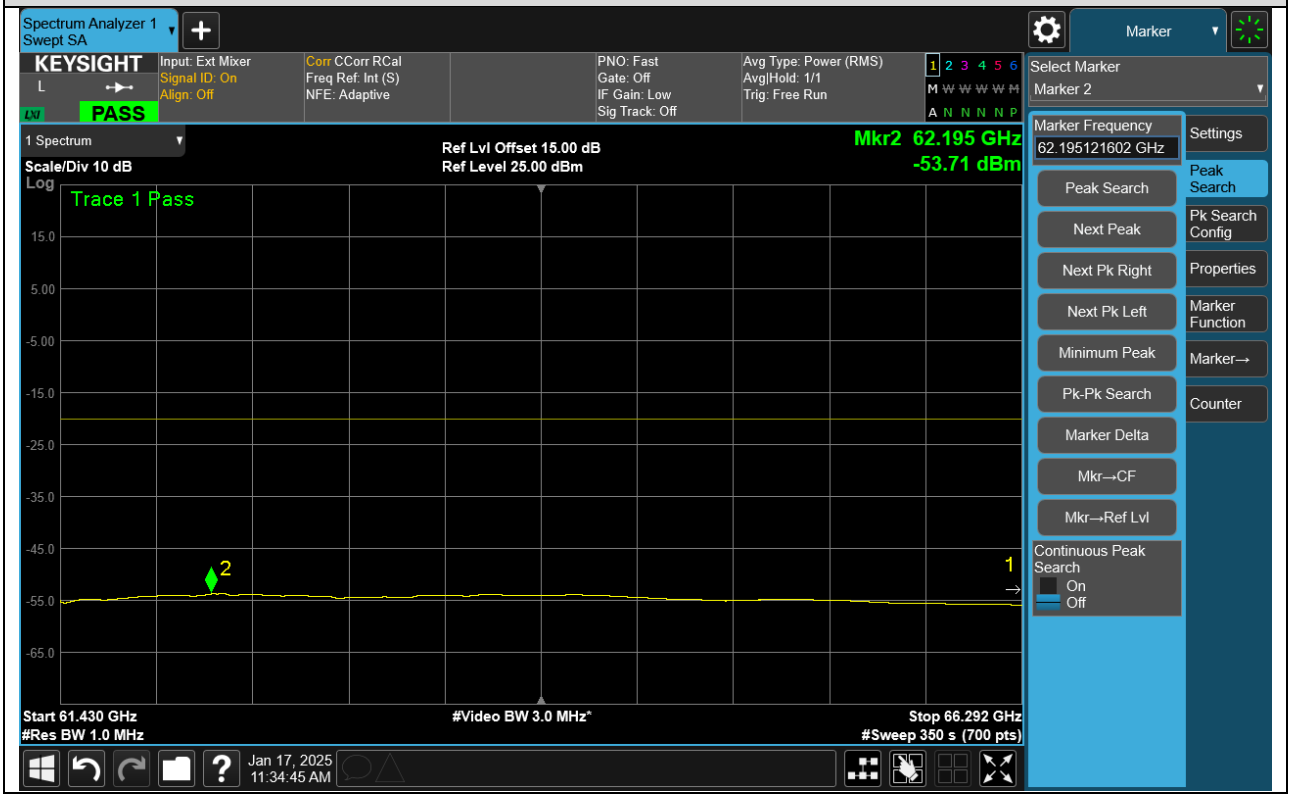
The description in ETSI EN 305 550-1, clause 7.4.3 applies.

3.4.4 Test result

F1 to FL OOB



FH to F2 OOB



3.5 UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

3.5.1 Limits

Frequency Range	Maximum Power Limit (e.r.p. (≤ 1 GHz) e.i.r.p. (> 1 GHz))	Detector type	RBW
30 MHz to 47 MHz	-36dBm	Quasi-Peak	100kHz
47 MHz to 74 MHz	-54dBm	Quasi-Peak	100kHz
74 MHz to 87,5 MHz	-36dBm	Quasi-Peak	100kHz
87,5 MHz to 118 MHz	-54dBm	Quasi-Peak	100kHz
118 MHz to 174 MHz	-36dBm	Quasi-Peak	100kHz
174 MHz to 230 MHz	-54dBm	Quasi-Peak	100kHz
230 MHz to 470 MHz	-36dBm	Quasi-Peak	100kHz
470 MHz to 862 MHz	-54dBm	Quasi-Peak	100kHz
862 MHz to 1 GHz	-36dBm	Quasi-Peak	100kHz
Above 1GHz	-30dBm	RMS	1MHz
According to CEPT/ERC Recommendation 74-01 [i.4], spurious emission is measured up to the 2nd harmonic of the fundamental frequency (in this case, the upper frequency limit up to which measurements are performed is 90 GHz).			

3.5.2 Test procedure

The description in ETSI EN 305 550-1, clause 7.5.3 applies.

METHOD OF MEASUREMENT	
☐ Conducted measurements	☒ Radiated measurements

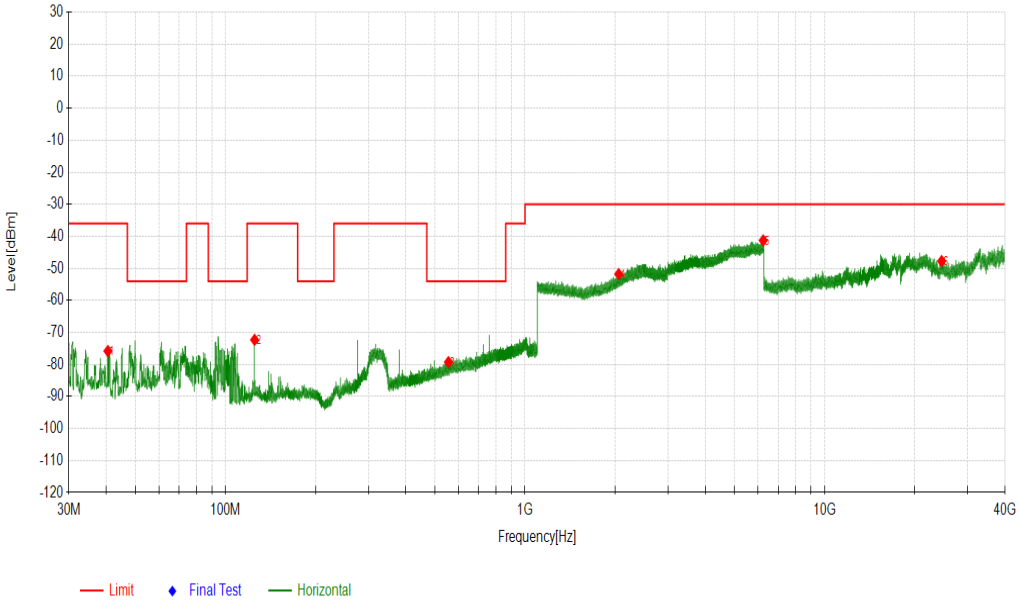
3.5.3 Test setup

See section 2.6 of this report.

3.5.4 Test result(30MHz-40GHz)

Frequency Range	30MHz-40GHz	Center Frequency	60.25GHz

Horizontal

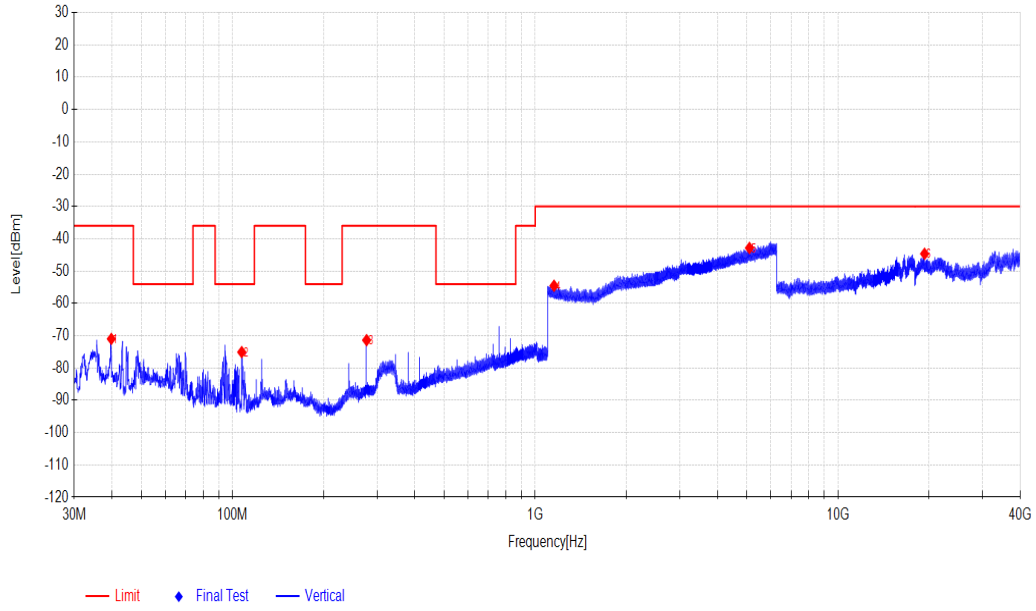


NO.	Frequency (MHz)	Reading [dBm]	Result (dBm)	Limit (dBm)	Margin (dB)	Factor [dB]	Azimuth (deg)
1	40.4325	-102.07	-75.81	-36.00	39.81	26.26	254
2	124.9625	-95.80	-72.31	-36.00	36.31	23.49	194
3	554.728	-110.99	-79.28	-54.00	25.28	31.71	315
4	2054.4333	-59.24	-51.79	-30.00	21.79	7.45	72
5	6241.425	-61.24	-41.25	-30.00	11.25	19.99	114
6	24608.25	-52.49	-47.73	-30.00	17.73	4.76	254

Remark: The emission levels of other frequencies were very low against the limit.

Frequency Range	30MHz-40GHz	Center Frequency	60.25GHz

Vertical

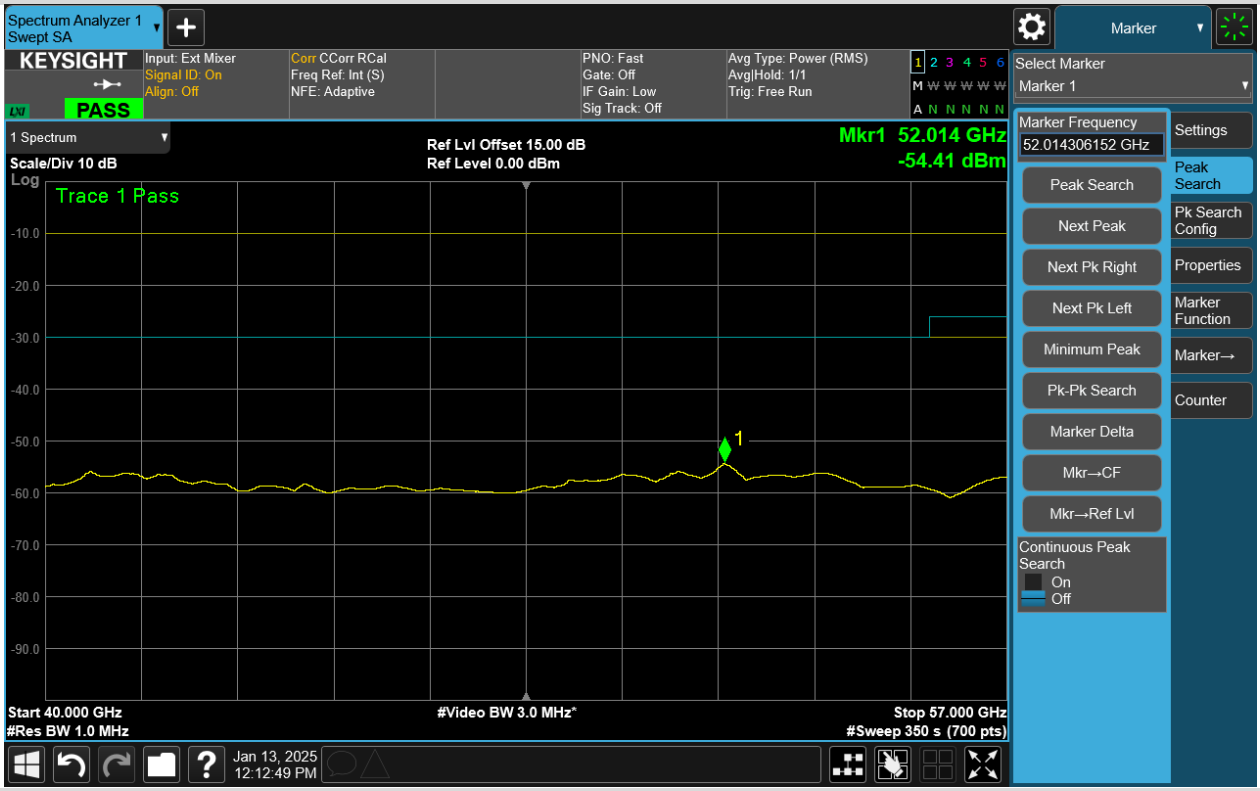


NO.	Frequency (MHz)	Reading [dBm]	Result (dBm)	Limit (dBm)	Margin (dB)	Factor [dB]	Azimuth (deg)
1	39.737	-98.20	-70.99	-36.00	34.99	27.21	175
2	107.147	-95.49	-75.07	-54.00	21.07	20.42	175
3	277.17	-96.85	-71.38	-36.00	35.38	25.47	237
4	1153.5167	-58.47	-54.53	-30.00	24.53	3.94	175
5	5103.6125	-60.75	-42.85	-30.00	12.85	17.90	71
6	19335.5833	-47.99	-44.64	-30.00	14.64	3.35	0

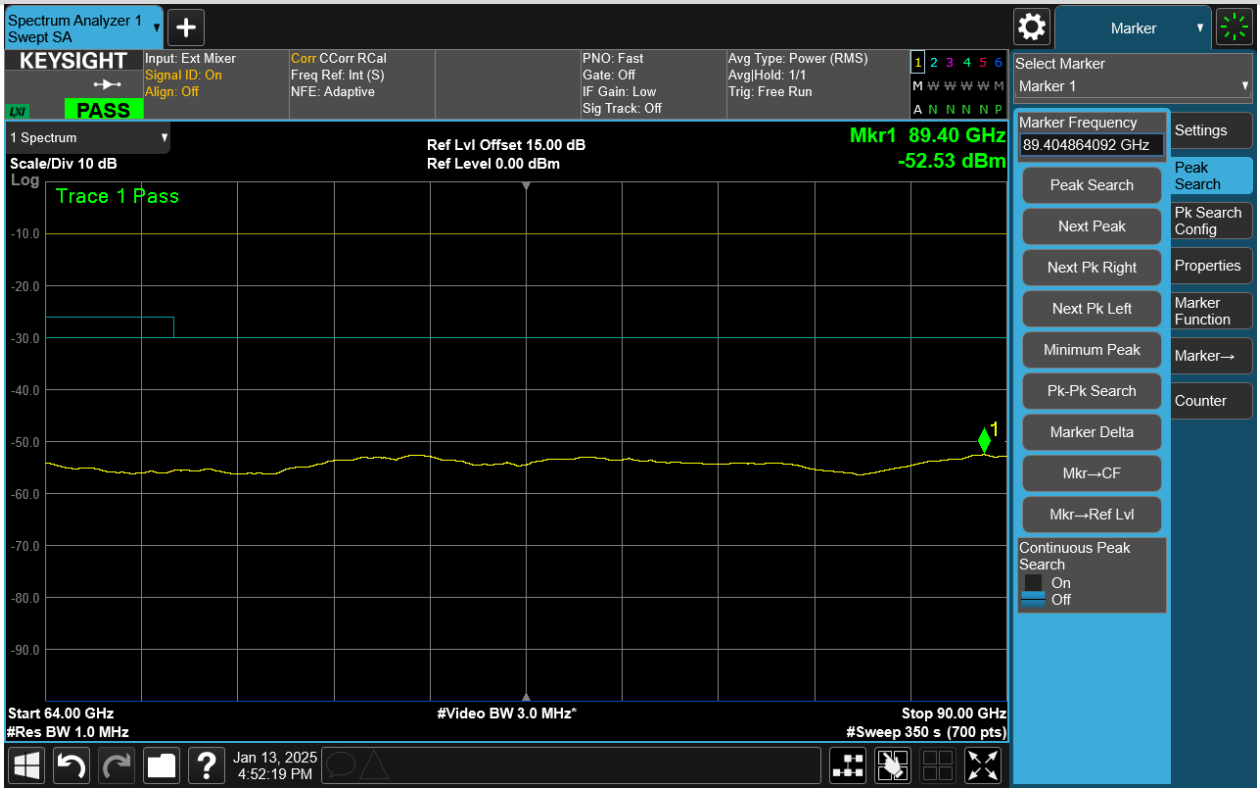
Remark: The emission levels of other frequencies were very low against the limit.

3.5.5 Test result(Above 40GHz)

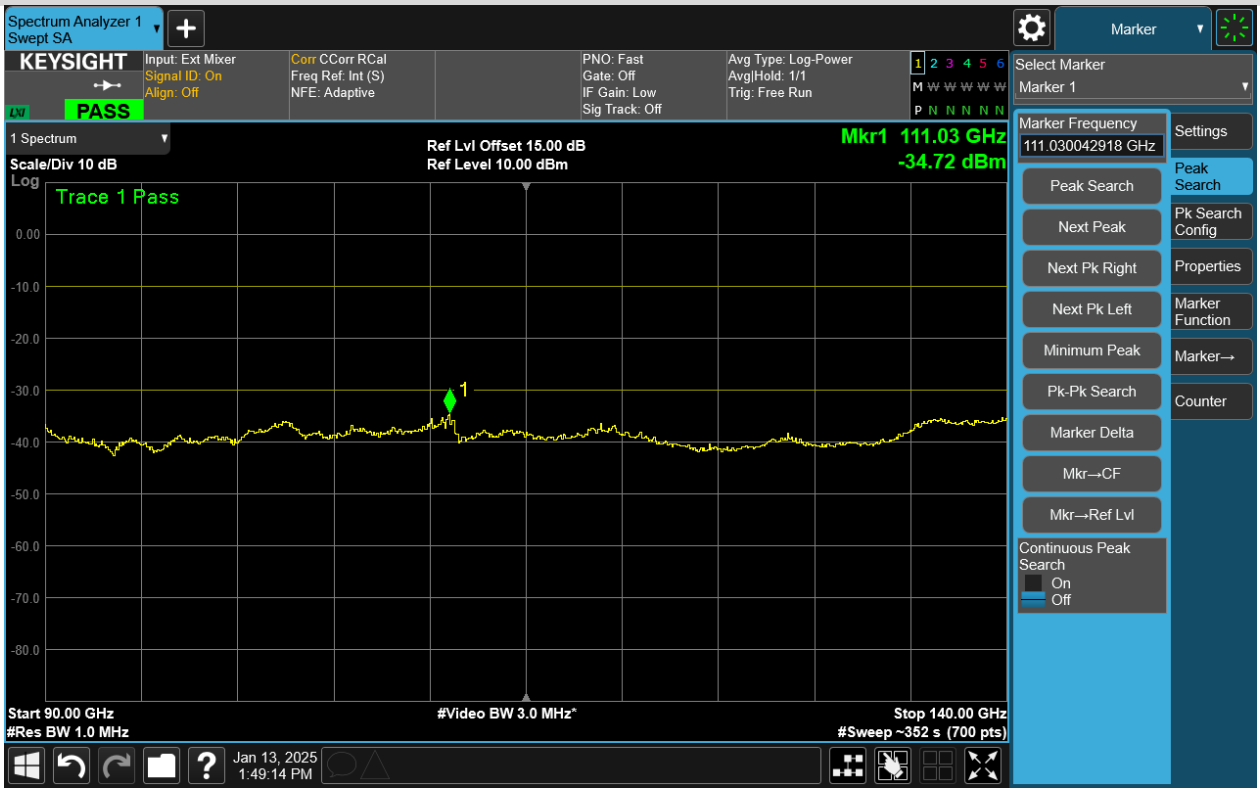
Unwanted Emissions, 40 GHz to 57 GHz, Horizontal / Vertical Polarization



Unwanted Emissions, 64 GHz to 90 GHz, Horizontal / Vertical Polarization



Unwanted Emissions, 90 GHz to 140 GHz, Horizontal / Vertical Polarization



3.6 RECEIVER SPURIOUS EMISSIONS

3.6.1 Limits

Frequency Range	Maximum Power Limit (e.r.p. (≤ 1 GHz) e.i.r.p. (> 1 GHz))	Detector type	Bandwidth
30MHz ~ 1GHz	-57dBm	Quasi-Peak	100kHz
1GHz ~ 142GHz	-47dBm	RMS	1MHz
Note: Measurement is only required up to the 2nd harmonic of the fundamental frequency (as defined in CEPT/ERC/REC 74-01 [i.1]). In this case, the upper frequency limit up to which measurements are performed is 162 GHz.			

3.6.2 Test procedure

The description in ETSI EN 305 550-1, clause 8.1.2 applies.

METHOD OF MEASUREMENT	
☐ Conducted measurements	☒ Radiated measurements

3.6.3 Test setup

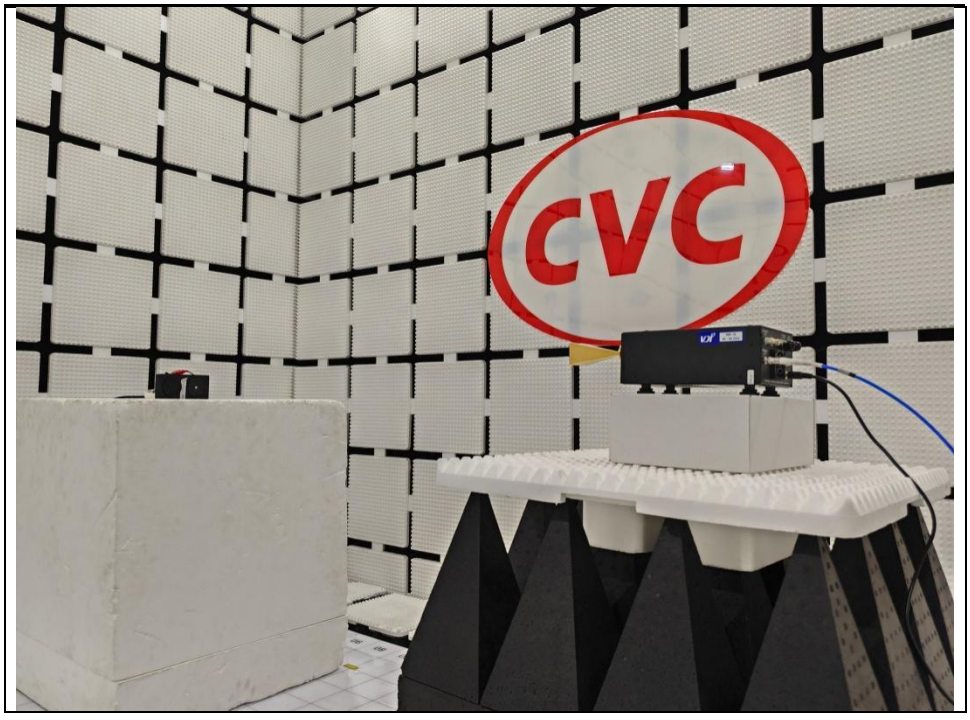
See section 2.6 of this report.

3.6.4 Test setup

N/A, The EUT can’t not operate in receive only mode.

4 PHOTOGRAPHS OF TEST SETUP

SPURIOUS EMISSION TEST-1



SPURIOUS EMISSION TEST-2

5 PHOTOGRAPHS OF EUT

Please refer to the attached file (External Photos report and Internal Photos).

------ End of the Report ------

Important

(1) The test report is invalid without the official stamp of CVC;

(2) Any part photocopies of the test report are forbidden without the written permission from CVC;

(3) The test report is invalid without the signatures of Approval and Reviewer;

(4) The test report is invalid if altered;

(5) Objections to the test report must be submitted to CVC within 15 days.

(6) Generally, commission test is responsible for the tested samples only.

(7) As for the test result “-” or “N” means “not applicable”, “/” means “not test”, “P” means “pass” and “F” means “fail”

Address: No. 1301-14&16, Guanguang Road, Xinlan Community, Guanlan Subdistrict, Longhua District, Shenzhen, Guangdong, China

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Fax：0755-23763060 E-mail：sz-kf@cvc.org.cn

http://www.cvc.org.cn